A G E N D A

Meeting of the North Dakota Atmospheric Resource Board
1:30 p.m. CDT, Thursday, November 2, 2023
Bank of North Dakota, Lewis & Clark Room
1200 Memorial Highway, Bismarck, North Dakota

This meeting will also be held by Microsoft Teams. Connection information is on the following page.

1. Call to Order, Roll Call
2. ***Approval of Minutes: April 12, 2023***
3. ARB Financial Updates
4. Review of the 2023 North Dakota Cloud Modification Project
   a) Project overview
   b) Cost summary
   c) Seeding agent usage/inventory
   d) Generator performance
   e) Intern programs
   f) UND Weather Research and Forecasting (WRF) numerical modeling
   g) Aircraft operations
   h) Contractor's final report / Approval of final contract payment
5. WMI fog dispersal research update
6. ***Administrative Code Updates from the Passage of HB 1072***
7. ARB Research & Evaluation Program
   a) Hail Retrieval Algorithm (HRA) assessment
8. Weather Radar Operations
9. ARB Cooperative Observer Network (ARBCON) Report
   b) Growing season rainfall totals and grid maps
   c) Pushing Remote Sensors (PReSens) – 2023 site deployment
10. 2024 Tentative Meeting Schedule
    a) April 11, 2024 (Thursday morning conference call)
    b) November 5, 2024 (Tuesday afternoon in-person)
11. ***Election of Officers***
12. International Collaboration with Korea Meteorological Administration
13. Other Business
14. Adjournment

Bold, italicized items require Board action.

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MINUTES - NORTH DAKOTA ATMOSPHERIC RESOURCE BOARD

APRIL 12, 2023

Chairman Chris Theisen called the video meeting of the Atmospheric Resource Board (Board) to order at 10:00 a.m. CDT, April 12, 2023.

ROLL CALL

Roll call was taken. Members present were Chris Theisen, District IV; Jessica Magilke, District VI; Thomas Burke, District VII; Kyle Wanner, Director, ND Aeronautics Commission; Rebekah Pfaff, ND Department of Environmental Quality (DEQ); and John Paczkowski, for Andrea Travnicek, Ph.D., Director, ND Department of Water Resources (DWR).

Others present were Darin Langerud, Director; Kelli Schroeder, Program Manager; Mark Schneider, Chief Meteorologist; Daniel Brothers, Meteorologist; Jody Fischer, Weather Modification International (WMI) and Dani Quissell, ND Weather Modification Association.

MINUTES

IT WAS MOVED BY KYLE WANNER AND SECONDED BY THOMAS BURKE TO APPROVE THE MINUTES OF THE NOVEMBER 1, 2022, MEETING AS DISTRIBUTED. ALL MEMBERS VOTED YEA. THERE WERE NO NAY OR ABSTAIN VOTES. MOTION CARRIED.

FINANCIAL STATUS REPORT

Kelli Schroeder reviewed the financial status report for the period ending February 28, 2023.

LEGISLATION

Darin Langerud informed the Board about legislation we are following that directly relates to the ARB division. These include House Bill (HB) 1072, a North Dakota Century Code (NDCC) cleanup bill to correct a reference to our division being a division of the State Water Commission. This was missed during the last session when the agency was changed to the Department of Water Resources. This bill passed both houses and has been signed by the Governor.

HB 1166 was carried primarily by Representative Ruby at the request of some of his constituents who wanted to require North Dakota Cloud Modification Project (NDCMP) participating counties to get approval from non-participating adjacent counties before receiving state cost share funds. There were several amendments and the bill passed

through the House. More amendments were made and passed out of the Senate Agriculture Committee with a 6-0 no recommendation. The committee had 3 Senators in favor of the bill and 3 against. After much debate on the Senate floor, the bill failed to pass by a vote of 14-33.

Senate Bill (SB) 2020 is the DWR budget bill. It includes our division and an optional budget package for a new dual-polarization radar to replace the Bowman radar, a 1974 WSR 74C, which we have been operating since 1997. SB 2020 passed the Senate without changes to our division budget items. It also came out of the House Appropriations subcommittee unchanged for our division. However, the House Appropriations committee sent it back to the subcommittee for additional amendments and committee work. Committee work will be occurring on this bill this afternoon.

If funding for the new radar is approved, it wouldn't be available until July. Langerud doesn't expect to be able to get it set up before spring 2024 as procurement procedures would need to be completed.

2023 NDCMP PERMIT APPLICATIONS

Public Comment

Darin Langerud informed the Board that the legal notice was published as required by statute for two consecutive weeks in the county newspapers in the target and adjacent counties in late February and early March regarding the permit applications received from WMI. There was a 20-day period for the public to comment following the publication. The comment period ended March 23, 2023.

One comment was received and provided to the board. The commenter resides in the Marmarth area, which is not in the target or operations area. The District 1 target area, which includes Bowman County and some southeastern Slope townships, does not include a buffer zone in 10 mile statute range around it in North Dakota counties. The area that this letter is from is not affected by cloud seeding, even though they may say the contrary in their letter.

JOHN PACZKOWSKI MOVED TO ACCEPT THE DIRECTOR'S RECOMMENDATION RELATING TO PERMIT APPLICATIONS. SECONDED BY KYLE WANNER. ALL MEMBERS VOTED AYE. THERE WERE NO NAY OR ABSTAIN VOTES. MOTION CARRIED.

Weather Modification LLC – NDCMP District 1 & 2

Darin Langerud reviewed the permit applications for NDCMP Districts 1 and 2 from Weather Modification LLC. He recommended the board approve the permit applications for both Districts 1 and 2 operational areas for the 2023 season.

THOMAS BURKE MOVED TO APPROVE THE WEATHER MODIFICATION PERMIT APPLICATIONS FROM WEATHER MODIFICATION, LLC, OF FARGO, ND. SECONDED BY KYLE WANNER. ALL MEMBERS VOTED AYE. THERE WERE NO NAY OR ABSTAIN VOTES. MOTION CARRIED.

NORTH DAKOTA CLOUD MODIFICATION PROJECT

Budget

Darin Langerud reviewed the draft budget for the NDCMP. Since HB 1166 failed, we expect this project will go forward following the 2022 configuration, including 3 aircraft in the northern district and 2 in the southern. We are in the process of reaching out to the counties with this information.

County contracts

Darin Langerud noted that a draft county contract has been reviewed by the DWR's attorney. We plan to complete county contracts in the next few weeks.

Langerud indicated that we had provided a budget option to show the counties the cost if HB 1166 passed and there was no cost share available when we met with them in February. He noted that it would not be their preference to operate without cost share and it would cause real difficulties. Budgeting on the county level happens in July for the upcoming calendar year. At that time, this bill was not on the radar for the counties and therefore the additional funds were not included in their budgets.

Staffing

Kelli Schroeder reviewed the status of hiring intern co-pilots. There were 9 applicants for 5 positions. This will be a difficult decision because the applicants are very good candidates. Promotional activities will continue at the University of North Dakota (UND) for the pilot internship.

Mark Schneider reported hiring returning staff members for the 2 radar meteorologist positions. Mark and Daniel Brothers are conducting interviews for the 3 intern meteorologist positions. They hope to have everyone hired by the end of this week or early next week.

Schneider noted that we rarely get applicants from UND for the radar and intern meteorologist positions, despite being well advertised with UND professors. Most applicants are from around the country. However, we are finding that our meteorology staff recently has been heading to UND for graduate work.

Seeding agent and supplies procurement

Mark Schneider reviewed remaining chemical inventory from last year and discussed procurement of chemicals. Due to the remaining inventory, we will not be purchasing additional silver iodide, ammonium iodide, or sodium perchlorate. We also have plenty of flares on hand. We will soon be purchasing acetone. Dry ice purchases will start just before June 1 and continue throughout the project. We are anticipating purchasing 19,000 pounds of dry ice over the summer.

Schneider indicated that we do not typically see supply chain issues with our chemical procurement. However, with more volatile fuel prices, we do receive bids that include variable fuel and transportation surcharges.

COOPERATIVE OBSERVER NETWORK UPDATE

Daniel Brothers reported that there are currently 423 active precipitation observers, a loss of about 70 observers. Additional recruiting activities will be done. We have 174 observers who reported snow last year and that appears to be steady. There are 159 reporting online.

He noted that maps are available on the web site. February maps should be up later this week or early next week. Then March maps will follow. He hopes to have a seasonal compilation map on the web site by the end of next week.

INTEGRATION OF METEOROLOGICAL AND SOIL SENSORS WITH PRESENS

Daniel Brothers reviewed DWR's Pushing REmote SENSors (PRESENS) system and integration of meteorological and soil sensors on 14 of the DWR's 300 sites. Our goal is to add an additional 30-40 meteorological and soil sensors this coming season.

Langerud reported that there are fewer people living in rural areas and people aren't as willing to volunteer as much as we used to see. One of the ways that we're trying to combat that and to be able to collect data in areas where we don't have volunteers is by using these remote sensing opportunities.

Additionally, a data point that's been lacking in the state is soil moisture and soil temperature data. The North Dakota Agricultural Weather Network (NDAWN) has several sites installed around the state, so we're looking at locations where we can augment that and provide additional information. We've had conversations with the NDAWN group, so we're not going to replicate each other's efforts. Our goal is to get 30 to 40 more installations out this year and continue that over time to try to get a better sense of what's happening with precipitation, especially convective precipitation. You need a dense network for that. And then with better understanding of soil temperature and moisture, this will help with agriculture along with flood forecasting.

Langerud indicated that there are the issues with collecting soil data in right-of-way areas such as DOT sites. We've had some discussions with the Souris River Basin group, in north central North Dakota, about instrumenting that watershed to try help them understand spring runoff. We have installed four sites up there already, and we're hoping to install two or three more again this summer to help with that effort.

Most of the PRESENS units are using cellular communications, but the board has been designed and configured to also be able to use satellite communications in areas where there's no cellular service. These units can be programmed to transmit as frequently or as infrequently as required. This is changed through firmware updates sent out from Bismarck. The agency is still working on getting a publicly available interface to access the PRESENS data.

JOHN PACZKOWSKI MOVED TO ADJOURN THE MEETING. SECONDED BY REBEKAH PFAFF. ALL MEMBERS VOTED AYE. THERE WERE NO NAY OR ABSTAIN VOTES. MOTION CARRIED.

Being no further business, the meeting adjourned at approximately 10:55 a.m.

_____	_____
CHRIS THEISEN	REBEKAH PFAFF
CHAIR	SECRETARY

Transcribed by Kelli Schroeder

ATMOSPHERIC RESOURCE BOARD
PROJECT BUDGET EXPENDITURES
FOR THE PERIOD ENDED AUGUST 31, 2023
BIENNIUM TIME: 8%

	SALARIES & WAGES	OPERATING EXPENSES	CAPITAL ASSETS	GRANTS	PROGRAM TOTALS
	77010	77030	77050	77063	
ADMINISTRATION (7500) - $1,064,081.00					**Project: WA75023**
Budget *	988,274.00	75,807.00	-	-	1,064,081.00
Expended	86,663.13	2,934.36	-	-	2,934.36
Percent	9%	4%	0%	0%	0%
OPERATIONS & RESEARCH (7600) - $7,019,850.00					**Projects: WA62023, WA62024, WA62025, WA68023, WA68024, WA68025, & WA69998**
Budget	240,724.00	571,100.00	1,845,000.00	4,363,026.00	7,019,850.00
Expended	50,451.24	33,824.27	-	304,697.48	388,972.99
Percent	21%	6%	0%	7%	6%
BUDGET *	1,228,998.00	646,907.00	1,845,000.00	4,363,026.00	8,083,931.00
EXPENDED	50,451.24	36,758.63	-	304,697.48	391,907.35
PERCENT	4%	6%	0%	7%	5%

FUNDING SOURCE:	**APPROPRIATION**	**EXPENDITURES**	**BALANCE**	**PERCENT**
General Funds	-	-	-	0%
Resource Trust Funds *	4,240,155.00	28,064.11	4,212,090.89	1%
County Funds	2,343,776.00	363,843.24	1,979,932.76	16%
Federal Funds	1,500,000.00	-	1,500,000.00	0%
TOTAL FUNDS: *	**8,083,931.00**	**391,907.35**	**7,692,023.65**	5%

** NOTE: FTE and board salary budget is shown under ARB Administration (7500) but is held agency-wide under the DWR Administration Division. Actual ARB division appropriation total is $7,095,657.*

REVENUE:	
General Funds	-
County Funds	150,892.00
Resources Trust Funds	-
Federal Funds	-
TOTAL	**150,892.00**

COST REVIEW FOR THE 2023 NDCMP

estimate for END OF PROJECT, assuming no penalties

ITEM	BUDGET	EXPENDITURES	UNDER/OVER
RADAR MAINTENANCE & PARTS	23,300.00	23,332.58	(32.58)
AIRCRAFT SERVICES	548,990.00	548,990.00	0.00
FLIGHT HOURS-BASE	41,844.00	21,711.37	20,132.63
FLIGHT HOURS-TOP TURBO	53,045.00	66,238.51	(13,193.51)
FUEL SURCHARGE	2,000.00	1,500.00	500.00
METEOROLOGISTS	56,258.00	55,836.74	421.27
SEEDING MATERIALS	60,980.00	25,826.72	35,153.28
TRAVEL/DELIVERY/FREIGHT	3,700.00	3,480.83	219.17
STORAGE	1,900.00	855.00	1,045.00
GROUND SCHOOL	1,700.00	1,470.00	230.00
COMMUNICATIONS	500.00	0.00	500.00
NEWSPAPER FEES	1,600.00	1,364.94	235.06
SUPPLIES/POSTAGE	750.00	753.18	(3.18)
BLDG & EQUIP/UTILITY/INSURANCE	4,500.00	11,348.43	(6,848.43)
TOTAL (DOLLARS)	**801,067.00**	**762,708.29**	**38,358.71**

2023 NDCMP Ending Chemical Inventory

Dry Chemical	Weight	Units	Value	Tot. Value
Silver Iodide	309.1 g	291	$162.86	$47,392.26
Ammonium Iodide	95.4 g	141	$18.40	$2,594.40
Sodium Perchlorate	161.85 g	149	$13.85	$2,063.65
Paradichlorobenzene	1.0 lb	10	$6.00	$60.00
TOTAL, All Dry Chemicals:				$52,110.31

Flares	Usable	Duds	Total Units	Value	Tot. Value
20g Ejectable ICE	2322	34	2356	$35.00	$82,460.00
75g Burn-In-Place ICE	925	21	946	$59.85	$56,618.10
TOTAL, All Flares:					$139,078.10

Liquid Chemicals (gallons)	SWC Yard	ARB Shed	ISN	STN	BPP	KEN	WCT	Value per Gal	Tot. Value
Acetone				175	220			$7.73	$3,053.35
Mixed Solution	92.4							$46.75	$4,319.88
TOTAL, All Liquid Chemicals:									$7,373.23

TOTAL, All Seeding Agents:	$198,561.64

Inventory Completed By:	Signature(s)	Date
Daniel Brothers		9/19/23

2023 NORTH DAKOTA CLOUD MODIFICATION PROJECT

DRY ICE REPORT

SEED 7

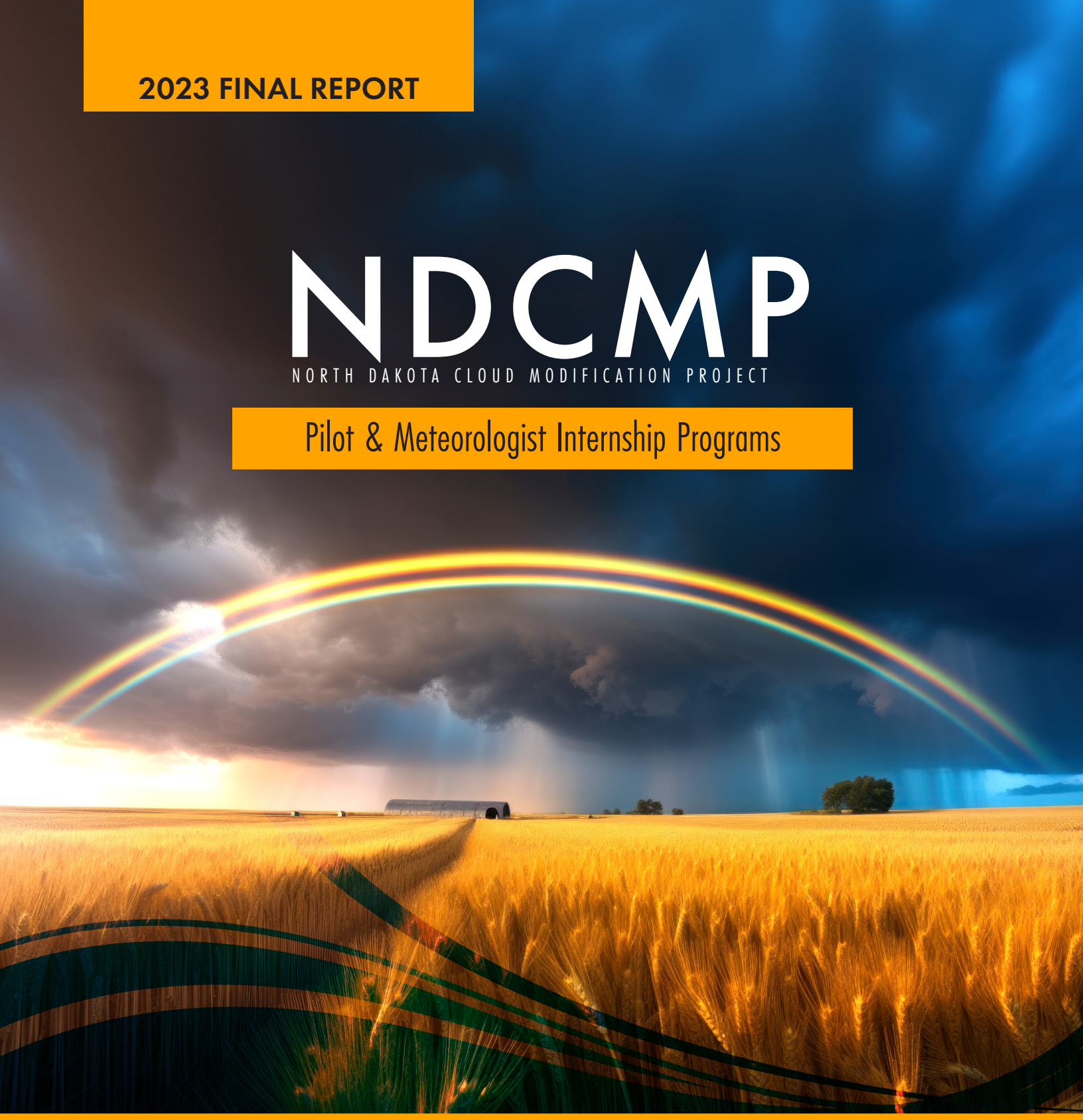
Dry ice purchased	20,371	lbs.
Dry ice expended	3,633	lbs.
Total purchase price (0.89/lb)	$ 17,401.80	
Cost per pound expended	$ 4.79	

2023 FINAL REPORT

NDCMP

NORTH DAKOTA CLOUD MODIFICATION PROJECT

Pilot & Meteorologist Internship Programs



Kelli Schroeder, Program Manager

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Cover artwork courtesy of Sheila Fryer, Graphic Artist, ND Department of Water Resources

Introduction

The Pilot Internship Program (PIP) and the Meteorology Internship Program (MIP) are designed to prepare qualified students for a professional career through participation in a summer intern position with the North Dakota Atmospheric Resource Board (NDARB) during the North Dakota Cloud Modification Project (NDCMP).

The Atmospheric Resource Board in cooperation with the University of North Dakota's John D. Odegard School of Aerospace Sciences (UND) have long recognized their shared roles in providing appropriate experience for students and young professionals. During the 2023 NDCMP, eight qualified young people worked as interns on a full-time basis. The NDARB internships are an important milestone for the students, enabling them to gain unique insight and experience and to have important responsibility directly in their field of interest. NDARB constantly seeks to improve its training process and the entire internship experience. The knowledge and skills acquired by the students enhance the development and stature of an emerging workforce.

History

The Pilot Internship Program (PIP) began in 1974 with a $274,000 grant from the National Science Foundation to the University of North Dakota for an "experimental project for training pilots in weather modification." The program was instantly successful, enrolling 70 students through the fall semester of 1976. That year, the ND Weather Modification Board (now Atmospheric Resource Board) entered into contract with UND to employ 14 interns on its summer cloud seeding program. By the mid-1980's, the Bureau of Reclamation ceased to fund the program. The NDARB continued funding the program until 2003, when funding was no longer available. The Board did continue the program by making internships available, however, only on a volunteer basis. Funding was restored for the program during the 2005 Legislative Assembly.

A Memorandum of Understanding between NDARB and UND outlines the responsibilities of both entities to create an opportunity to prepare students for a professional career through participation in a summer intern position. Specific criteria are required to be eligible for the PIP. At the completion of the 2023 program, the program has provided training and experience for 407 pilots.

The NDCMP Meteorology Internship Program began in 1996 and to date has provided hands-on radar, operations and forecasting experience for 73 meteorology undergraduates and graduates.

Program Description

The following presents an outline of the program, its objectives, design, and main delivery components.

Program Objectives

- Encourage students to expand their education beyond the classroom.
- Enable students to sample actual situations and prepare for Pilot-In-Command (PIC) and Radar Meteorologist duties.
- Develop professional work habits and improve interpersonal skills of students.
- Establish a pool of potential professional employees who have demonstrated their abilities to assume in-command responsibilities.

Qualifications

Candidates for the MIP must be at least an undergraduate pursuing a degree in meteorology or atmospheric sciences. Applicants must apply and are scored and rated for selection by NDARB.

Candidates for the PIP must be at least an undergraduate pursuing an Aviation-related degree at UND. Applicants must apply and are scored and rated for selection by NDARB and UND.

Selection criteria for the PIP includes:

- Ratings: must have multi-engine commercial instrument rating completed by April 30.
- Motivation: class attendance, extra credit work, and overall enthusiasm for fieldwork.
- GPA: Complete the Applied Weather Modification class.
- Flight hours: total and multi-engine time.
- Related work experience.

Since 2018 due to a lack of applicants who were in the Applied Weather Modification class or had taken the class previously, NDARB accepted applications from UND student pilots who did not take the class. Preference was given to students who are in the class or have taken it in the past.

Program Design

The PIP is designed for the primary benefit of the persons placed on the program including multi-engine flight hours (number of hours dependent on weather conditions), Instrument

Flight Rules (IFR) and adverse weather flight experience, and operations experience for future employment as weather modification Pilots-In-Command (PIC).

The MIP is designed for the primary benefit of providing hands-on radar experience, real-time weather observations, weather forecasting experience, and operations experience for future employment as weather modification radar meteorologists.

The programs are designed for positive, active involvement of the interns. The decision whether or not to allow each pilot intern to fly the airplane (from left or right seat) rests with the PIC. In the case of the MIP, the supervising Radar Meteorologist determines when a meteorologist intern is qualified to run operations during a mission. It is most beneficial if the interns receive direct, hands-on experience. In general, the assignment of each intern is to learn the duties of his/her supervisor/mentor. This includes the following areas of involvement:

- Conduct of seeding missions according to project guidelines.
- Detailed record-keeping of all missions.
- Seeding equipment maintenance.
- Visual surveillance of the weather.
- Representing the project to the public.
- Duties that will meet project objectives as directed by NDARB.

Support and Supervision

The NDCMP is a 24/7 project for 92 days, or longer if an extension occurs, and ongoing communications are vital. Each intern was assigned a Supervisor/Mentor who offered guidance, encouragement, and general counsel. An "always-available" policy enabled the interns' access to individuals at any time for answers to questions, accept feedback, and help with project objectives. This policy created an environment in which the interns felt comfortable asking questions, and aided in keeping the interns productive, no matter what time of the day or night.

Orientation & Pre-project Training

Orientation and training were accomplished for the ND Cloud Modification Project Ground School on May 24 through 26, 2023. All project personnel were required to attend. During Ground School, the interns received a detailed overview of cloud seeding science and technology, and information that clarified their specific tasks and roles on the NDCMP, including operations, policy, rules and regulations.

Accountability

Daily, participants were required to document the number of hours worked using the agency's web-based time-reporting system. At the end of the workweek, the supervising PICs or meteorologists reviewed, commented and approved the interns' hours, which were forwarded to NDARB via email. The comments served to track performance and the time entry provided a database of official hours worked for Fair Labor Standards Act and payroll purposes.

ARB full-time staff made multiple visits to field locations to check on quantity and quality of work, receive and make suggestions and criticisms, and consider adjustments to the program.

Continuing Development

Participants were encouraged to become involved in networking with NDARB and contractor employees. Sharing information on work experiences and performance is critical to the professional development and growth of the individual. Feedback on the intern's progress was provided as a professional development tool and to provide clarification of NDARB's expectations of what constitutes quality performance on the job.

Approximately two months into the internship, the supervisors/mentors conducted peer-review evaluations of the participants and discussed the results with them. The interns were also asked to evaluate the internship program. The program manager and chief meteorologist then visited with each intern and offered comments and critical suggestions for improvement and further development. At this time, comments were also received from the interns regarding possible changes and improvements to the program for the future.

Legal Considerations

Interns of the NDARB are temporary unclassified employees and were paid at the rate of $15.84 per hour. The NDARB workweek is from Monday at 12:00 a.m. to Sunday at 11:59 p.m. Any overtime hours worked within the workweek required prior authorization. Internship employees were covered under the agency's Workforce Safety policy.

Program Information

During the 2023 NDCMP, the 5 PIP interns worked a total of 2,201.75 hours. These hours were spent at weather briefings, operations flight missions, chemical mixing and inventory, record keeping, aircraft and seeding equipment maintenance, alert status prior to launch, and public relations.

Intern pilots are rotated through the Watford City location to give all a chance to experience high-altitude turbo-prop aircraft operations.

The 3 MIP interns worked a total of 1,350.03 hours. These hours were spent at weather briefings, forecasting, assisting with operations flight missions, radar watch, record keeping, and public relations. All project personnel are responsible for "weather watch" at all times during the project.

Each intern meteorologist was given the opportunity to rotate through the two radar locations. This gave each intern a chance to experience operations in each district.

Most intern participants had completed their internship and left the project by mid-August to return to college.

2023 Participants

Pilot Interns & Field Site:
Christian Chederquist, Seed 1, Bowman
Rasam Shaaeli, Seed 2, Bowman
Kieran Viggiano, Seed 4, Stanley
Austin Krause, Seed 5, Williston
Laura Standen, King Air Rover

Meteorologist Interns & Field Site:
Eliza Fries, Bowman
Danielle Harr, Stanley
Cody Cameron, Stanley

Recommendations

The following are recommendations from students for consideration for future efforts:

Meteorology Internship Program

- Earlier communication on location assignments and project information before project begins, relating mostly to making living and travel arrangements.

Pilot Internship Program

- Earlier communication on location assignments and project information before project begins, relating mostly to making living and travel arrangements.
- Do a better job reaching out to the public and informing them about what we do and why it is important. Some ideas include hosting a dinner for the public (possibly at the Stanley Farmer's Market), allowing crews to take aircraft to events such as nearby airport fly-ins and air shows, and more.
- Adopt glass cockpit airplanes, providing advanced silver iodide crushing tools and upgrading personal protective equipment.

Acknowledgements

NDARB wishes to thank the Radar Meteorologists and Pilots-In-Command for their efforts and assistance in serving as supervisors and mentors during the 2023 NDCMP Internship Programs. They are as follows.

Pilots-In-Command
Heinrich Adriaanse, Seed 1, Bowman
Brooke Buccowich, Seed 2, Bowman
Lucas Castro, Seed 4, Stanley
Jake Floyd, Seed 5, Williston
Ryan Starkey, Seed 7, Watford City

Radar Meteorologists
Jacob Azriel, Bowman
Ben Schaefer, Stanley

NDARB also appreciates the efforts of the following.

- Dr. David Delene, UND John D. Odegard School of Aerospace Sciences
- Mr. Jody Fischer, Vice President of Operations, Weather Modification, International
- Mr. Kirk Hamilton, Chief Pilot, Weather Modification, International
- Mr. Alex Sailsbury, UAS Operations Specialist, Weather Modification, International
- Mrs. Erin Fischer, Client Services Director, Weather Modification, International
- Mr. Jake Van Ornum, Documentation Specialist, Weather Modification, International
- Mr. Brady Wolkow, Client Services, Weather Modification, International
- Ms. Jordyn Carrabre, Relief Intern, Weather Modification, International

We would also like to congratulate Austin Krause (recipient of the 2023 Hans P. Ahlness Intern Award) for his dedication to the program, hard work, and ambition.

Attachments

- Intern Performance Evaluation
- Evaluation of Meteorology and Pilot Internship Program

NORTH DAKOTA CLOUD MODIFICATION PROJECT
INTERN PERFORMANCE EVALUATION

NORTH DAKOTA DEPARTMENT OF WATER RESOURCES
ATMOSPHERIC RESOURCE BOARD
SFN 61334 (8/2021)

The evaluating supervisor will complete the evaluation. We urge that each supervisor evaluate the intern's performance together with him/her. Please be candid. This joint evaluation is of paramount importance to the intern's professional and personal development. The evaluation will be a guide for counseling the intern. Additional space is provided for your comments. Please comment on any evaluation marked marginal or unsatisfactory.

Please place an "X" in the appropriate column for each characteristic.

Intern Name						Date
Characteristics	**Excellent**	**Very Good**	**Average**	**Marginal**	**Unsatisfactory**	**Not Applicable**
Desire and willingness to take on new assignments						
Potential for further development						
Concern for needs of fellow employees						
Willingness to work through an assignment to completion						
Ability to communicate						
Quality of work						
Dependability						
Attitude (application to work)						
Attendance						
On-time						
Judgment						
Imaginativeness and resourcefulness						
Cooperation – willingness to get along with others						
Technical skills						
Interpersonal skills – general public						

Intern Name	Date

Narrative appraisal of performance

Additional comments and/or recommendations

I understand that this intern will have access to the information in this evaluation and that it is a public record.
I have discussed this evaluation with the intern.

Signature	Date

NORTH DAKOTA CLOUD MODIFICATION PROJECT
INTERNSHIP PROGRAM EVALUATION

NORTH DAKOTA DEPARTMENT OF WATER RESOURCES
ATMOSPHERIC RESOURCE BOARD
SFN 61335 (8/2021)

Name	
Evaluation of: (Please place "X" in the first column and appropriate row.)	
	METEOROLOGY INTERNSHIP PROGRAM
	PILOT INTERNSHIP PROGRAM

This evaluation will be very important in determining the value of your work experience, both for yourself and for students who may wish to follow you in the same situation. The evaluation should be honest and indicate problems as well as your progress during the period. Please address your evaluative remarks so that your coordinator can discuss them with the organization to improve and maintain the program.

In what ways did your classes prepare you for your internship?

What other courses and/or work experience do you think would have helped you with this internship?

What was the most helpful thing your supervisor did to make you feel comfortable as a staff member?

In what manner has this assignment contributed to your professional development?

Prior to beginning your job, did the agency give you adequate information to start your project?

Do you consider the Internship Program relevant and meaningful to your short/long-term career interests?

List three things you plan to do differently as a result of this program.

How would you rate the educational value of your internship?	
	Exceptional opportunity.
	Worthwhile experience.
	Generally not too useful, but might help some.
	Probably of no value (please comment).
Comments	

How was the experience related to your major field or career goals?	
	Very closely related.
	Related through occasional assignments.
	No relationship exists.
	Not applicable (please comment).
Comments	

To what degree do you feel other employees supported the internship program?	
	Atmosphere was openly supportive.
	Accepted, but not openly supportive.
	Generally not accepted or understood.
	Non-supportive and potentially hostile.
	Does not apply (please comment).
Comments	

How would you rate your salary in relation to requirements of position, your experience, and your academic level?	
	Position paid comparably to full-time employees.
	Position well paid.
	Definitely underpaid for service expected.
	Does not apply (please comment).
Comments	

Were the actual duties of the position commensurate with the job description?	
	Experience closely matches that offered.
	Experience mostly matches that offered.
	Little relationship exists.
	Extremely unsatisfactory (please comment).
Comments	

How did your technical skills apply to the position?	
	Were more than adequate.
	Were adequate.
	Were less than they should have been.
Comments	

Did you receive a proper job orientation?	
	Complete, accurate.
	Somewhat related.
	Had no meaning.
	Does not apply.
Comments	
Evaluate your supervisor's willingness and capability of answering questions.	
	Exceeded expectations.
	Met expectations.
	Less than expected.
Comments	
Evaluate your supervisor's availability when needed for questions, etc.	
	Exceeded expectations.
	Met expectations.
	Less than expected.
Comments	
Evaluate your supervisor's receptiveness to new ideas you might have had?	
	Exceeded expectations.
	Met expectations.
	Less than expected.
Comments	
How would you rate your relationship with supervisor?	
	Exceeded expectations.
	Met expectations.
	Less than expected.
Comments	
What changes, if any, would you recommend in your internship?	
What other areas of experience would you like to acquire through this internship?	

Overall Rating	
	Excellent
	Very Good
	Average
	Marginal
	Unsatisfactory

NARRATIVE EVALUATION

The second part of the evaluation requires a narrative evaluation of the work that was done during the internship. Please include in the narrative the following topics:

- The role your position plays in the overall goals and mission of the project.
- Relationship of the position to the organization's structure.
- Academic classes that prepared you or fell short of preparing you for the job.
- Problem-solving techniques used.
- Communication skills used.
- Leadership skills used.
- Decision-making skills used.
- Administrative skills used.
- Agency staff assistance.
- Success and failure experienced.
- Any recommendations.

Your Narrative

Any photos, articles, etc. may be included with the evaluation. Please indicate properly the source of all such material.

I understand this evaluation and narrative will be used to evaluate the Internship program and is a public record.

Signature	Date

NORTH Dakota
Be Legendary.

Atmospheric Resource Board
WATER RESOURCES

MEMORANDUM

TO: ATMOSPHERIC RESOURCE BOARD

FROM: DARIN LANGERUD, DIRECTOR

SUBJECT: 2023 NDCMP LIQUIDATED DAMAGES

DATE: OCTOBER 12, 2023

In consideration of daily NDCMP aircraft operational requirements outlined in contract ARB-WMI-22-1, the operations reviewed and Director's recommendations in such cases follow. The pertinent contract language is stated below:

ARTICLE XII: LIQUIDATED DAMAGES

Due to the difficulties that would arise in determining the State's damages upon Contractor's breach, the parties, after careful consideration, agree that Contractor must pay damages to the State in the amounts specified below.

1. For each operational day during the Project period that a specific aircraft is inoperable, whenever personnel are unable to conduct a Project flight, or whenever the Contractor refuses to conduct a Project flight after being instructed to do so by the Board, the Contractor must be subject to damages of 2% of the aircraft base cost bid per day:

   A. $1,640.00, $1,689.20, and $1,739.88 per day for cloud-base seeding aircraft during the 2022, 2023, and 2024 Project seasons, respectively.

   B. $4,100.00, $4,223.00, and $4,379.70 per day for cloud-top seeding aircraft during the 2022, 2023, and 2024 Project seasons, respectively.

2. The Director will determine those days during which seeding capability was lost due to an inoperable aircraft. The Director, by discretion, may waive portions or all such damages if satisfied that the Contractor demonstrated all reasonable efforts were made to return the subject aircraft to operational status during such days.

Reviewed Cases

Incident #1 Seed 7 (N709EA) on 6/1/23.

Description:
Seed 7 was enroute from Fargo to Watford City for initial project relocation when isolated pulse-type thunderstorms developed in southeastern Mountrail County during the late afternoon. The aircraft was flying without seeding flares and dry ice and required landing in Watford City to load before being ready for operations. Seed 4 was launched at 2104Z and seeded for dual purposes, but at 2232Z had to return to Stanley prematurely due to an engine rocker arm malfunction. Seed 7 was placed on Alert status at 2158Z, but it was Seed 5 who was alternatively launched at 2253Z for what ended up being a reconnaissance flight with no seeding conducted. Later that evening, additional storms developed and Seed 7 was launched at 0227Z from Watford City for seeding operations.

Recommendation:
No penalty recommended.

Incident #2 Seed 1 (N13AG) on 6/1/23 through 6/2/23.

Description:
Seed 1 was still in Fargo being readied for its initial project relocation flight to Bowman when Seed 2 was launched at 2225Z to storms in eastern Bowman/Slope Counties. Dual purpose seeding operations were conducted until 0008Z that evening. Had Seed 1 been available, they would have been launched for seeding operations. Seed 1 flew from Fargo to Bowman on June 2nd and was onsite and ready for service at 1908Z.

Recommendation:
One-day penalty for missed flight on June 1.

Incident #3 Seed 4 (N121WA) on 6/1/23 through 6/2/23.

Description:
Seed 4 was launched at 2104Z on June 1st and conducted brief seeding operations before having a malfunction with a rocker arm which required an immediate return to Stanley. Seed 5 was quickly launched at 2253Z for what ended up being a reconnaissance flight with no seeding conducted. A WMI mechanic crew arrived in Stanley during the afternoon of June 2nd to fix the aircraft.

Recommendation:
No penalty recommended.

Incident #4 Seed 2 (N33144) on 6/8/23 through 6/9/23.

Description:
Seed 2 flew a dual-purpose seeding flight during the afternoon and upon landing, discovered that one of their tires was significantly worn, grounding the aircraft. Seed 1 flew two evening flights, but the radar meteorologist concluded that two aircraft weren't needed for operations that evening. At 1845Z the following afternoon, Seed 2's tire was replaced, the aircraft returned to service and was immediately launched to join Seed 1 on a mission.

Recommendation:
No penalty recommended.

SUMMARY RECOMMENDATION: ONE-DAY PENALTY OUTLINED IN INCIDENT #2.